

were machined all over and accurate within  $\pm 0.005$  inch. The drilling was performed in two operations; the two  $\frac{1}{2}$ -inch holes and the  $\frac{1}{4}$ -inch hole were drilled simultaneously in the first operation, the  $\frac{1}{8}$ -inch hole being drilled in the second operation. This order of drilling was necessary, as the  $\frac{1}{8}$ -inch drills would have been deflected by cutting into the larger hole, but the  $\frac{1}{4}$ -inch drill having a larger diameter was not affected by cutting into the smaller holes.

The first problem was to design jigs for holding the blocks that would require the minimum amount of time in loading and unloading. At *B* is shown the jig that was used successfully for drilling the  $\frac{1}{8}$ -inch hole. It is similar in design and operation to the one that was used for drilling the two  $\frac{1}{8}$ -inch holes and the  $\frac{1}{4}$ -inch hole. The jig consists of the cast-iron body *C*, which is set on legs five inches high in order to provide hand room for using the handle *D*, and also to give a sharper angle to the discharge chute *E*, and at the same time to provide clearance for the receiving box at the end of the chute.

The slide or movable jaw *F* is made a close sliding fit in the body *C* and is held in place by pieces *G*. Jaw *F* carries at the forward end the hardened wearing piece *H* and the templet *K* for guiding the drill, the templet *K* being attached to the movable jaw in this case to allow greater freedom in loading. Sliding jaw *F* is dosed upon the work by the movement of the cam *7*, which is of such shape as to give a powerful grip to the jaws, a wide loading space, and a quick movement. Tension spring *I* holds the slide back, leaving the jaws always in an open position, except when forced together by means of pressure exerting on the hand-lever *D*. A carbon steel locating piece *L* is doweled to the body to receive the blocks; it is accurately lined up with the hole in templet *K*. The block when in place rests on a half floor extending across and in front of the opening in *L*. Just in front of this is the large opening into which the blocks fall, and beneath which the chute *E* is placed. A light spring, not shown, knocks the blocks off into the opening when the slide *F* is withdrawn, and they slide down the chute into the receiving box. It is only necessary for the operator